

OCTOBER 24, 2013 – WATER QUALITY COORDINATING COMMITTEE

# Climate Change and Wastewater: How Should the Water Boards Adapt?

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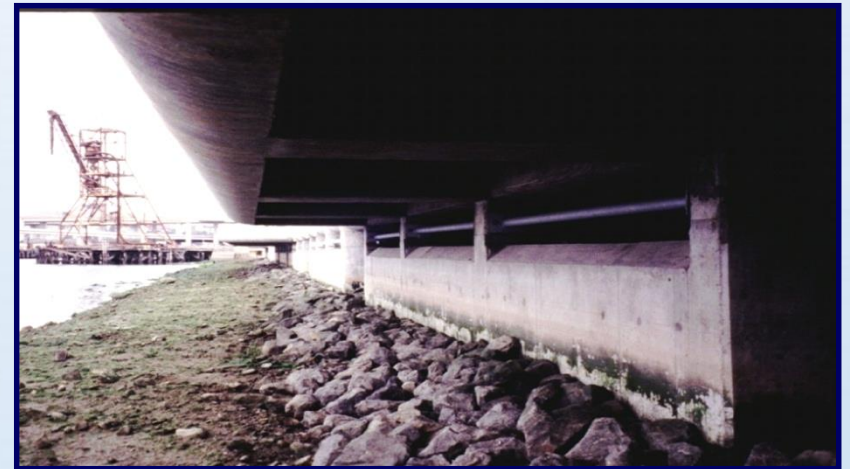
# Wastewater treatment plants are typically at the low point in a watershed

- Low elevations (and near the coast)
- Receiving
  - Residential, commercial and industrial wastewater
  - Stormwater either through infiltration and inflow or in a combined sewer
- Discharging effluent to rivers, bays, ocean...often within the floodplain inland



# Challenges the wastewater community face due to climate change include...

- Impact
  - Rising sea (high tide) levels
- Potentially leading to
  - Inundation of infrastructure and facilities
  - Brackish groundwater infiltration into collection systems
  - Effluent being pumped out of a bay or ocean discharge





# Challenges the wastewater community face due to climate change include...

- Impact
  - Changes in extreme precipitation events (increase in peak wet weather events)
- Leading to
  - Increased flows
  - Increased loads (suspended solids, biological oxygen demand, etc)
  - Need for blending



*Extreme storm events can result in water inflow exceeding the current capacity of our wastewater infrastructure – total costs to restore and adapt U.S. wastewater systems to climate change range between \$420-550 billion\**

# BUT permits are becoming very prescriptive, requiring...

- Full secondary treatment for wet weather events
- Low levels of biological oxygen demand and total suspended solids in discharged effluent
- No bypasses

*Wastewater treatment plants need creative permits and funding to adapt*

# And normal operation will change with these changing conditions, requiring more...

- Pumping
- Mixing
- Advanced Treatment
- Aeration





# As we know, water and energy are inextricably linked...

Energy production and generation require water



Water/Wastewater pumping, treatment, and conveyance, and water end use consumes:

- 19% CA electricity
- 32% CA natural gas

Over 70% of electricity consumed in the south is for conveying water from the north – water conservation and reuse can reduce this

# **CA's POTWs can also contribute toward most of the State's major 2020 targets aimed at mitigating climate change...**

- Reducing carbon dioxide equivalent emissions to 1990 levels (AB 32)
- Reducing the carbon intensity of transportation fuel used in the State by 10 percent (AB 32)
- Providing 33 percent of the State's energy needs from renewable sources (AB 32)
- Recycling 75 percent of the solid waste generated in the State (AB 32 and AB 341)
- 20 percent per capita reduction in urban water demand (SB X7 7)



# POTWs can contribute toward meeting each of these statewide targets with...

- “Wastewater to Energy” projects
  - Biogas to energy
  - Biogas to transportation fuel (biofuel)

↓ GHG reduction

↑ renewable energy production

↑ low carbon fuel

- “GHG offset” projects - land application of digestate/biosolids
  - Store carbon
  - Displace synthetic fertilizer

↓ GHG reduction

- Increase soil’s carbon retention with digestate vs. synthetic fertilizer
- Replacing energy-intensive synthetic fertilizer

# Water Boards need to address barriers that POTWs face in adapting to/mitigating climate change, including...

- Lack of financial incentives to restore and adapt infrastructure
- Integrated watershed planning approach
- Future wet weather management options
  - Low impact development / green infrastructure
  - Wetlands (natural treatment)
  - Blending policies – set appropriate design storms
- Point-of-use treatment for recycled water use
- Coordination of multiple permitting agencies on projects with multiple benefits

# Thank you!



## Questions?

<http://www.casaweb.org/>